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1 Data clustering: a review



A. K. Jain, M. N. Murty, P. J. Flynn

 September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Publisher: ACM Press

Full text available: pdf(636.24 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters). The clustering problem has been addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal and usefulness as one of the steps in exploratory data analysis. However, clustering is a difficult problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

Keywords: cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning

2 Articles on microarray data mining: Towards interactive exploration of gene expression patterns



Daxin Jiang, Jian Pei, Aidong Zhang

 December 2003 **ACM SIGKDD Explorations Newsletter**, Volume 5 Issue 2

Publisher: ACM Press

Full text available: pdf(527.68 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#)

Analyzing coherent gene expression patterns is an important task in bioinformatics research and biomedical applications. Recently, various clustering methods have been adapted or proposed to identify clusters of co-expressed genes and recognize coherent expression patterns as the centroids of the clusters. However, the interpretation of co-expressed genes and coherent patterns mainly depends on the domain knowledge, which presents several challenges for coherent pattern mining and cannot be solv ...

3 Hierarchical scene structure representations to facilitate image understanding



A. J. Maren, M. Ali

 June 1988 **Proceedings of the 1st international conference on Industrial and engineering applications of artificial intelligence and expert systems - Volume 2 IEA/AIE '88**

Publisher: ACM Press


Full text available:  pdf(838.63 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

4 Seeing, hearing, and touching: putting it all together



Brian Fisher, Sidney Fels, Karon MacLean, Tamara Munzner, Ronald Rensink
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available:  pdf(20.64 MB) Additional Information: [full citation](#)

5 Selected writings on computing: a personal perspective



Edsger W. Dijkstra
January 1982 Book

Publisher: Springer-Verlag New York, Inc.

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#), [index terms](#)

Since the summer of 1973, when I became a Burroughs Research Fellow, my life has been very different from what it had been before. The daily routine changed: instead of going to the University each day, where I used to spend most of my time in the company of others, I now went there only one day a week and was most of the time that is, when not travelling!-- alone in my study. In my solitude, mail and the written word in general became more and more important. The circumstance that my employe ...

6 Multiclass Cancer Classification Using Semisupervised Ellipsoid ARTMAP and Particle Swarm Optimization with Gene Expression Data



Rui Xu, Georgios C. Anagnostopoulos, Donald C. Wunsch

January 2007 **IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)**, Volume 4 Issue 1

Publisher: IEEE Computer Society Press

Full text available:  pdf(3.70 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It is crucial for cancer diagnosis and treatment to accurately identify the site of origin of a tumor. With the emergence and rapid advancement of DNA microarray technologies, constructing gene expression profiles for different cancer types has already become a promising means for cancer classification. In addition to research on binary classification such as normal versus tumor samples, which attracts numerous efforts from a variety of disciplines, the discrimination of multiple tumor types is ...

Keywords: Cancer classification, gene expression profile, semisupervised ellipsoid ARTMAP, particle swarm optimization.

7 Ecological interface enabling human-embodied cognition in mobile robot teleoperation



Tetsuo Sawaragi, Yukio Horiguchi
September 2000 **intelligence**, Volume 11 Issue 3

Publisher: ACM Press

Full text available:  pdf(1.59 MB)  html(38.16 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

8 Book review: Competitively Inhibited Neural Networks for Adaptive Parameter Estimation by Michael Lemmon (Kluwer Academic Publishers, 1991)





Joseph M. Barone
October 1992 **ACM SIGART Bulletin**, Volume 3 Issue 4

Publisher: ACM Press

Full text available: pdf(566.62 KB) Additional Information: [full citation](#), [abstract](#), [references](#)

Rigorous, formal treatments of neural network fundamentals (i.e., treatments whose arguments consist primarily of theorems and proofs) have by now focused on a number of aspects. The convergence properties (stability) and capacity of neural nets of various types have been analyzed in this manner to one degree or another (e.g., [1-3]), and their expressive power has also been the subject of a number of formal analyses (e.g., [4]). Though not necessarily perfectly rigorous in the sense just mention ...

9 A template-based and pattern-driven approach to situation awareness and



assessment in virtual humans

Weixiong Zhang, Randal W. Hill

June 2000 **Proceedings of the fourth international conference on Autonomous agents AGENTS '00**

Publisher: ACM Press

Full text available: pdf(1.20 MB) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: organizational and spatial relationship, pattern matching, perception, situation awareness and assessment, templates

10 OPTICS: ordering points to identify the clustering structure



Mihael Ankerst, Markus M. Breunig, Hans-Peter Kriegel, Jörg Sander

June 1999 **ACM SIGMOD Record , Proceedings of the 1999 ACM SIGMOD international conference on Management of data SIGMOD '99**, Volume 28 Issue 2

Publisher: ACM Press

Full text available: pdf(1.77 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Cluster analysis is a primary method for database mining. It is either used as a stand-alone tool to get insight into the distribution of a data set, e.g. to focus further analysis and data processing, or as a preprocessing step for other algorithms operating on the detected clusters. Almost all of the well-known clustering algorithms require input parameters which are hard to determine but have a significant influence on the clustering result. Furthermore, for many real-data sets there doe ...

Keywords: cluster analysis, database mining, visualization

11 iVIBRATE: Interactive visualization-based framework for clustering large datasets



Keke Chen, Ling Liu

April 2006 **ACM Transactions on Information Systems (TOIS)**, Volume 24 Issue 2

Publisher: ACM Press

Full text available: pdf(4.48 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

With continued advances in communication network technology and sensing technology, there is astounding growth in the amount of data produced and made available through cyberspace. Efficient and high-quality clustering of large datasets continues to be one of the most important problems in large-scale data analysis. A commonly used methodology for cluster analysis on large datasets is the three-phase framework of sampling/summarization, iterative cluster analysis, and disk-labeling. There are th ...

Keywords: Clustering, interactive visualization, labeling, large datasets, performance

12 Bayesian Network Learning with Parameter Constraints

Radu Stefan Niculescu, Tom M. Mitchell, R. Bharat Rao

December 2006 **The Journal of Machine Learning Research**, Volume 7

Publisher: MIT Press

Full text available:  pdf(300.61 KB) Additional Information: [full citation](#), [abstract](#)

The task of learning models for many real-world problems requires incorporating domain knowledge into learning algorithms, to enable accurate learning from a realistic volume of training data. This paper considers a variety of types of domain knowledge for constraining parameter estimates when learning Bayesian networks. In particular, we consider domain knowledge that constrains the values or relationships among subsets of parameters in a Bayesian network with known structure.

We inco ...

13 Exploiting inheritance and structure semantics for effective clustering and buffering in an object-oriented DBMS

E. E. Chang, R. H. Katz

June 1989 **ACM SIGMOD Record , Proceedings of the 1989 ACM SIGMOD international conference on Management of data SIGMOD '89**, Volume 18 Issue 2

Publisher: ACM Press

Full text available:  pdf(1.21 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Object-oriented databases provide new kinds of data semantics in terms of inheritance and structural relationships. This paper examines how to use these additional semantics to obtain more effective object buffering and clustering. We use the information collected from real-world object-oriented applications, the Berkeley CAD Group's OCT design tools, as the basis for a simulation model with which to investigate alternative buffering and clustering strategies. Observing from our measurement ...

14 Special issue on ICML: Coupled clustering: a method for detecting structural correspondence

Zvika Marx, Ido Dagan, Joachim M. Buhmann, Eli Shamir

March 2003 **The Journal of Machine Learning Research**, Volume 3

Publisher: MIT Press

Full text available:  pdf(967.15 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

This paper proposes a new paradigm and a computational framework for revealing equivalencies (analogies) between sub-structures of distinct composite systems that are initially represented by unstructured data sets. For this purpose, we introduce and investigate a variant of traditional data clustering, termed *coupled clustering*, which outputs a configuration of corresponding subsets of two such representative sets. We apply our method to synthetic as well as textual data. Its achievement ...

15 Clustering: Efficiently clustering transactional data with weighted coverage density

Hua Yan, Keke Chen, Ling Liu

November 2006 **Proceedings of the 15th ACM international conference on Information and knowledge management CIKM '06**

Publisher: ACM Press

Full text available:  pdf(367.51 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It is widely recognized that developing efficient and fully automated algorithms for

clustering large transactional datasets is a challenging problem. In this paper, we propose a fast, memory-efficient, and scalable clustering algorithm for analyzing transactional data. Our approach has three unique features. First, we use the concept of Weighted Coverage Density as a categorical similarity measure for efficient clustering of transactional datasets. The concept of weighted coverage density is in ...

Keywords: AMI, LISR, SCALE, weighted coverage density

16 Special issue on the fusion of domain knowledge with data for decision support: Fusion of domain knowledge with data for structural learning in object oriented domains

Helge Langseth, Thomas D. Nielsen

December 2003 **The Journal of Machine Learning Research**, Volume 4

Publisher: MIT Press

Full text available:  [pdf\(227.18 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

When constructing a Bayesian network, it can be advantageous to employ structural learning algorithms to combine knowledge captured in databases with prior information provided by domain experts. Unfortunately, conventional learning algorithms do not easily incorporate prior information, if this information is too vague to be encoded as properties that are local to families of variables. For instance, conventional algorithms do not exploit prior information about repetitive structures, which are ...


17 External and internal representations appropriate for ART neural networks



M. Cader, D. Benachenhou, L. Medsker, H. Szu

September 1990 **Proceedings of the 1990 ACM SIGBDP conference on Trends and directions in expert systems SIGBDP '90**

Publisher: ACM Press

Full text available:  [pdf\(691.54 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

18 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research CASCON '97**

Publisher: IBM Press

Full text available:  [pdf\(4.21 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

19 Paper session KM-3 (knowledge management): classification & clustering: Versatile structural disambiguation for semantic-aware applications



Federica Mandreoli, Riccardo Martoglia, Enrico Ronchetti

October 2005 **Proceedings of the 14th ACM international conference on Information and knowledge management CIKM '05**

Publisher: ACM Press

Full text available:  [pdf\(216.35 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this paper, we propose a versatile disambiguation approach which can be used to make

explicit the meaning of structure based information such as XML schemas, XML document structures, web directories, and ontologies. It can be of support to the semantic-awareness of a wide range of applications, from schema matching and query rewriting to peer data management systems, from XML data clustering to ontology-based automatic annotation of web pages and query expansion. The effectiveness of the achi ...

Keywords: semantic web, structure based information, word sense disambiguation

20 Data cleaning and integration: Leveraging data and structure in ontology integration



Octavian Udrea, Lise Getoor, Renée J. Miller

June 2007 **Proceedings of the 2007 ACM SIGMOD international conference on Management of data SIGMOD '07**

Publisher: ACM Press

Full text available: pdf(462.13 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

There is a great deal of research on ontology integration which makes use of rich logical constraints to reason about the structural and logical alignment of ontologies. There is also considerable work on matching data instances from heterogeneous schema or ontologies. However, little work exploits the fact that ontologies include both data and structure. We aim to close this gap by presenting a new algorithm (ILIADS) that tightly integrates both data matching and logical reasoning to achieve ...

Keywords: data integration, logical inference, ontology alignment, schema mapping, statistical inference

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1 [Building and Using a Lexical Knowledge Base of Near-Synonym Differences](#)

Diana Inkpen, Graeme Hirst

June 2006 **Computational Linguistics**, Volume 32 Issue 2**Publisher:** MIT Press

Full text available: pdf(3.60 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [cited by](#)

The initial knowledge base is later enriched with information from other machine-readable dictionaries. Information about the collocational behavior of the near-synonyms is acquired from free text. The knowledge base is used by Xenon, a natural language generation system that shows how the new lexical resource can be used to choose the best near-synonym in specific situations.

2 [Web 1--exploiting graph structure: Respect my authority!: HITS without hyperlinks, utilizing cluster-based language models](#)

Oren Kurland, Lillian Lee

August 2006 **Proceedings of the 29th annual international ACM SIGIR conference on Research and development in information retrieval SIGIR '06****Publisher:** ACM Press

Full text available: pdf(210.69 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We present an approach to improving the precision of an initial document ranking wherein we utilize cluster information within a graph-based framework. The main idea is to perform reranking based on *centrality* within bipartite graphs of documents (on one side) and clusters (on the other side), on the premise that these are mutually reinforcing entities. Links between entities are created via consideration of language models induced from them. We find that our cluster-document graphs give r ...

Keywords: HITS, authorities, bipartite graph, cluster-based language models, clusters, graph-based retrieval, high-accuracy retrieval, hubs, language modeling, structural re-ranking

3 [Multiclass Cancer Classification Using Semisupervised Ellipsoid ARTMAP and Particle Swarm Optimization with Gene Expression Data](#)

Rui Xu, Georgios C. Anagnostopoulos, Donald C. Wunsch

January 2007 **IEEE/ACM Transactions on Computational Biology and Bioinformatics (TCBB)**, Volume 4 Issue 1**Publisher:** IEEE Computer Society Press

Full text available:  pdf(3.70 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

It is crucial for cancer diagnosis and treatment to accurately identify the site of origin of a tumor. With the emergence and rapid advancement of DNA microarray technologies, constructing gene expression profiles for different cancer types has already become a promising means for cancer classification. In addition to research on binary classification such as normal versus tumor samples, which attracts numerous efforts from a variety of disciplines, the discrimination of multiple tumor types is ...

Keywords: Cancer classification, gene expression profile, semisupervised ellipsoid ARTMAP, particle swarm optimization.

4 Collective entity resolution in relational data



Indrajit Bhattacharya, Lise Getoor

March 2007 **ACM Transactions on Knowledge Discovery from Data (TKDD)**, Volume 1 Issue 1

Publisher: ACM Press

Full text available:  pdf(511.57 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Many databases contain uncertain and imprecise references to real-world entities. The absence of identifiers for the underlying entities often results in a database which contains multiple references to the same entity. This can lead not only to data redundancy, but also inaccuracies in query processing and knowledge extraction. These problems can be alleviated through the use of *entity resolution*. Entity resolution involves discovering the underlying entities and mapping each database ...

Keywords: Entity resolution, data cleaning, graph clustering, record linkage

5 Automatic verb classification based on statistical distributions of argument structure



Paola Merlo, Suzanne Stevenson

September 2001 **Computational Linguistics**, Volume 27 Issue 3

Publisher: MIT Press

Full text available:  pdf(341.42 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)
 [Publisher Site](#)

Automatic acquisition of lexical knowledge is critical to a wide range of natural language processing tasks. Especially important is knowledge about verbs, which are the primary source of relational information in a sentence---the predicate-argument structure that relates an action or state to its participants (i.e., who did what to whom). In this work, we report on supervised learning experiments to automatically classify three major types of English verbs, based on their argument structure--sp ...

6 IR-KM-1 (information retrieval and knowledge management): text mining: Event threading within news topics



Ramesh Nallapati, Ao Feng, Fuchun Peng, James Allan

November 2004 **Proceedings of the thirteenth ACM international conference on Information and knowledge management CIKM '04**

Publisher: ACM Press

Full text available:  pdf(123.27 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

With the overwhelming volume of online news available today, there is an increasing need for automatic techniques to analyze and present news to the user in a meaningful and efficient manner. Previous research focused only on organizing news stories by their topics into a flat hierarchy. We believe viewing a news topic as a flat collection of stories

is too restrictive and inefficient for a user to understand the topic quickly.

In this work, we attempt to capture the rich structure of ...

Keywords: clustering, dependency, event, threading

7 Knowledge management session 4: indexing: Bootstrapping for hierarchical document classification



Giordano Adami, Paolo Avesani, Diego Sona

November 2003 **Proceedings of the twelfth international conference on Information and knowledge management CIKM '03**

Publisher: ACM Press

Full text available: pdf(180.73 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Managing the hierarchical organization of data is starting to play a key role in the knowledge management community due to the great amount of human resources needed to create and maintain these organized repositories of information. Machine learning community has in part addressed this problem by developing hierarchical supervised classifiers that help maintainers to categorize new resources within given hierarchies. Although such learning models succeed in exploiting relational knowledge, they ...

Keywords: TaxSOM, constrained clustering, k-means, taxonomy bootstrapping process, text categorization

8 Legal knowledge bases 3: document retrieval: Effective document clustering for large heterogeneous law firm collections



Jack G. Conrad, Khalid Al-Kofahi, Ying Zhao, George Karypis

June 2005 **Proceedings of the 10th international conference on Artificial intelligence and law ICAIL '05**

Publisher: ACM Press

Full text available: pdf(517.35 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Computational resources for research in legal environments have historically implied remote access to large databases of legal documents such as case law, statutes, law reviews and administrative materials. Today, by contrast, there exists enormous growth in lawyers' electronic work product within these environments, specifically within law firms. Along with this growth has come the need for accelerated knowledge management--automated assistance in organizing, analyzing, retrieving and presenti ...

Keywords: document clustering, knowledge management, legal data, taxonomy development

9 Using multiple knowledge sources for word sense discrimination



Susan W. McRoy

March 1992 **Computational Linguistics**, Volume 18 Issue 1

Publisher: MIT Press

Full text available: pdf(2.02 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#)
[Publisher Site](#)

This paper addresses the problem of how to identify the intended meaning of individual words in unrestricted texts, without necessarily having access to complete representations of sentences. To discriminate senses, an understander can consider a diversity of

information, including syntactic tags, word frequencies, collocations, semantic context, role-related expectations, and syntactic restrictions. However, current approaches make use of only small subsets of this information. Here we will des ...

10 Answering Clinical Questions with Knowledge-Based and Statistical Techniques

Dina Demner-Fushman, Jimmy Lin

March 2007 **Computational Linguistics**, Volume 33 Issue 1

Publisher: MIT Press

Full text available:  pdf(295.45 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

The combination of recent developments in question-answering research and the availability of unparalleled resources developed specifically for automatic semantic processing of text in the medical domain provides a unique opportunity to explore complex question answering in the domain of clinical medicine. This article presents a system designed to satisfy the information needs of physicians practicing evidence-based medicine. We have developed a series of knowledge extractors, which employ a ...

11 Data clustering: a review



A. K. Jain, M. N. Murty, P. J. Flynn

September 1999 **ACM Computing Surveys (CSUR)**, Volume 31 Issue 3

Publisher: ACM Press

Full text available:  pdf(636.24 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Clustering is the unsupervised classification of patterns (observations, data items, or feature vectors) into groups (clusters). The clustering problem has been addressed in many contexts and by researchers in many disciplines; this reflects its broad appeal and usefulness as one of the steps in exploratory data analysis. However, clustering is a difficult problem combinatorially, and differences in assumptions and contexts in different communities has made the transfer of useful generic co ...

Keywords: cluster analysis, clustering applications, exploratory data analysis, incremental clustering, similarity indices, unsupervised learning


12 Long papers: knowledge acquisition and knowledge-based design: Suggesting novel but related topics: towards context-based support for knowledge model extension



Ana Maguitman, David Leake, Thomas Reichherzer

January 2005 **Proceedings of the 10th international conference on Intelligent user interfaces IUI '05**

Publisher: ACM Press

Full text available:  pdf(1.11 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Much intelligent user interfaces research addresses the problem of providing information relevant to a current user topic. However, little work addresses the complementary question of helping the user identify potential topics to explore next. In knowledge acquisition, this question is crucial to deciding how to extend previously-captured knowledge. This paper examines requirements for effective topic suggestion and presents a domain-independent topic-generation algorithm designed to generate ca ...

Keywords: automatic topic search, concept mapping, context, human-centered knowledge acquisition tools

13

Multiple-view geometry for image-based modeling

 Jana Košecká, Yi Ma, Stefano Soatto, René Vidal
August 2004 **ACM SIGGRAPH 2004 Course Notes SIGGRAPH '04**

Publisher: ACM Press

Full text available:  pdf(23.14 MB) Additional Information: [full citation](#), [abstract](#)

This course presents the state of the art in multiple-view geometry, including methods and algorithms for reconstructing 3-D geometric models of scenes from video or photographs. This course is based on a novel approach to multiple-view geometry that only requires linear algebra, as opposed to more involved projective and algebraic geometry that most current methods employ. This new approach aims to make image-based modeling techniques accessible to a larger audience compared to existing ones.
T ...

14 Terminology-based knowledge mining for new knowledge discovery

 Hideki Mima, Sophia Ananiadou, Katsumori Matsushima
March 2006 **ACM Transactions on Asian Language Information Processing (TALIP)**,
Volume 5 Issue 1

Publisher: ACM Press

Full text available:  pdf(1.36 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In this article we present an integrated knowledge-mining system for the domain of biomedicine, in which automatic term recognition, term clustering, information retrieval, and visualization are combined. The primary objective of this system is to facilitate knowledge acquisition from documents and aid knowledge discovery through terminology-based similarity calculation and visualization of automatically structured knowledge. This system also supports the integration of different types of database ...

Keywords: Automatic term recognition, biomedicine, natural language processing, structuring knowledge, terminology, visualization

15 Language models: Corpus structure, language models, and ad hoc information retrieval

 Oren Kurland, Lillian Lee
July 2004 **Proceedings of the 27th annual international ACM SIGIR conference on Research and development in information retrieval SIGIR '04**

Publisher: ACM Press

Full text available:  pdf(214.33 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


Most previous work on the recently developed *language-modeling* approach to information retrieval focuses on document-specific characteristics, and therefore does not take into account the structure of the surrounding corpus. We propose a novel algorithmic framework in which information provided by document-based language models is enhanced by the incorporation of information drawn from *clusters* of similar documents. Using this framework, we develop a suite of new algorithms. Even t ...

Keywords: aspect models, cluster-based language models, clustering, interpolation model, language modeling, smoothing

16 Cluster ensembles --- a knowledge reuse framework for combining multiple partitions

Alexander Strehl, Joydeep Ghosh
March 2003 **The Journal of Machine Learning Research**, Volume 3

Publisher: MIT Press

Full text available:  pdf(842.50 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper introduces the problem of combining multiple partitionings of a set of objects into a single consolidated clustering *without* accessing the features or algorithms that determined these partitionings. We first identify several application scenarios for the resultant 'knowledge reuse' framework that we call *cluster ensembles*. The cluster ensemble problem is then formalized as a combinatorial optimization problem in terms of shared mutual information. In addition to a direct ...

Keywords: cluster analysis, clustering, consensus functions, ensemble, knowledge reuse, multi-learner systems, mutual information, partitioning, unsupervised learning

17 Personalized Hierarchical Clustering

Korinna Bade, Andreas Nurnberger

December 2006 **Proceedings of the 2006 IEEE/WIC/ACM International Conference on Web Intelligence WI '06**

Publisher: IEEE Computer Society

Full text available:  pdf(247.66 KB) Additional Information: [full citation](#), [abstract](#)

A hierarchical structure can provide efficient access to information contained in a collection of documents. However, such a structure is not always available, e.g. for a set of documents a user has collected over time in a single folder or the results of a web search. We therefore investigate in this paper how we can obtain a hierarchical structure automatically, taking into account some background knowledge about the way a specific user would structure the collection. More specifically, we ada ...

18 Hierarchical scene structure representations to facilitate image understanding



A. J. Maren, M. Ali

June 1988 **Proceedings of the 1st international conference on Industrial and engineering applications of artificial intelligence and expert systems - Volume 2 IEA/AIE '88**

Publisher: ACM Press

Full text available:  pdf(838.63 KB) Additional Information: [full citation](#), [references](#), [index terms](#)

19 Hypergraph partitioning for VLSI CAD: methodology for heuristic development, experimentation and reporting



Andrew E. Caldwell, Andrew B. Kahng, Andrew A. Kennings, Igor L. Markov

June 1999 **Proceedings of the 36th ACM/IEEE conference on Design automation DAC '99**

Publisher: ACM Press

Full text available:  pdf(108.62 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 Systems: Multimodal group action clustering in meetings



Dong Zhang, Daniel Gatica-Perez, Samy Bengio, Iain McCowan, Guillaume Lathoud

October 2004 **Proceedings of the ACM 2nd international workshop on Video surveillance & sensor networks VSSN '04**

Publisher: ACM Press

Full text available:  pdf(484.02 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We address the problem of clustering multimodal group actions in meetings using a two-layer HMM framework. Meetings are structured as sequences of group actions. Our approach aims at creating one cluster for each group action, where the number of group actions and the action boundaries are unknown a priori. In our framework, the first layer

models typical actions of individuals in meetings using supervised HMM learning and low-level audio-visual features. A number of options that explicitly m ...

Keywords: automatic meeting analysis, multi-person event modeling, multi-sensor networks

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